

ABSTRACT

In an aspect, an apparatus is provided that sets and reprograms the state of programmable devices. In an aspect, the quantity of programmable material is minimized, and the programmable material that is reprogrammed from an amorphous to a crystalline state, and vice versa, is localized on a contact. In an aspect, a method is provided such that an opening is formed through a dielectric exposing a contact formed on a substrate. A spacer is formed within the opening and a programmable material is formed within the opening such that the spacer reduces the programmable material on the contact. A conductor is formed on the programmable material and the contact transmits to a signal line.